PROJECT DOCUMENTATION

Idea: We were inspired to make this kind of device when a neighbour was stolen from and had to watch hours of CCTV footage to be able to spot the intruder.

Problem Statement: CCTV’s were invented for the sole purpose of protection and being our eyes at the doors. But with changing times, these alone are not enough to guard a place. CCTV’s have been effective in protecting spaces by simply watching them. But, thieves have also advanced and are able to hide from these CCTV’s. Most of them are inefficient as one often has to go through an entire footage to be able to view a small scene. Some CCTV’s try to counter the problem by adding motion sensors and placing the CCTV’s on doors and walls to be able to detect people. But this just makes it easier for thieves to hide from the viewing CCTV.

SDG Goal: This project is in line with Goal 11: Sustainable cities and communities

Constraints: We had to keep this project cheaper than the cheapest CCTV with motion sensors (₹1500)

Solutions: We had options to use:-  
 Esp8266 with heat sensor

Esp8266 with ultrasound sensor

Esp8266 with IR sensor

Esp32 with camera and a sensor

Final Solution: Esp8266 with IR sensor

We went with this solution as we were not able to reliably use a camera with esp32. Also the heat sensor was too expensive and the ultrasound sensor was not reliable or customizable. To counter the inefficiencies of CCTV, we came up with the solution of placing an IR sensor near the Side of the door so that it would be able to send an alarm when the door is open. This system when coupled with a camera is extremely efficient as we can also look at the footage. This system, however, needs to be installed inside the door’s frame for detecting when the person is outside. But if there is a pre-installed door or a glass door, this can be placed just above the door ledge to detect when the door is opened. This alarm can be received by Amazon Alexa using Alexa Voice Monkey or on Gmail.

Name: Watch door

Materials: Our system consists of an IR sensor to read whether the door is open or not. It is connected to an ESP8266 which can send signals using WIFI to a website which processes these signals to give an output. This system can be modified according to the client’s needs. We use Arduino IDE as our coding software and use a combination of Adafruit and IFTTT to identify the signals and give correct outputs.

1 IR sensor ₹ 40

1 ESP 8266 ₹ 350

1 Micro B USB Cable ₹ 70

1 USB Adapter ₹ 150

TOTAL ₹ 610

(All prices are including taxes and shipping)

This system is considerably cheaper than CCTV’s with distance sensors as some of the cheapest ones cost around ₹1000. This price can be further brought down by purchasing large quantities at wholesale prices.

Skills Used:-

Design thinking

CAD

Electronics

Laser cutting

Challenges: 1. the main challenge was to be able to understand how the IR sensor works to make the

system as efficient and precise as possible.

2.It took a long time to find and make a code suitable for our project

3.The biggest problem was making a model for the box within which the IR sensor was

contained . Even with fusion 360, it was difficult to make the 3D model of the box which

would contain the components

4. It was our first time getting parts laser cut so we were not able to properly create the

grooves required for our model

4. Last but not least it was also problematic to find a good sensor for using in our project

References: <https://www.instructables.com/Interface-InfraRed-Sensor-Using-NodeMCU/>

For connection diagrams and help with arduino coding